



**AEI**  
**Consultants**

Environmental & Engineering Services

**RCRA/TSCA CLEANUP PLAN  
For BASF SITE  
CRANSTON, RHODE ISLAND**

**Presented to: U.S. EPA Region 1, Boston, MA  
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## **AGENDA**

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1. **Review of Site History**
2. **Overview of Prior Investigations and Cleanups**
3. **EPA-Approved CMS Requirements**
4. **Proposed Site Reuse and Floodplain Boundaries**
5. **Proposed Alternate TSCA/RIDEM Remedy and Benefits**
6. **Project Schedule and Milestones**

## FACILITY HISTORY:

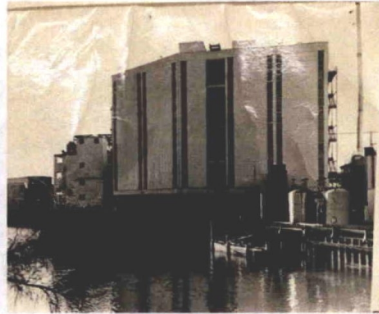
1952 to 1986 : Ciba-Geigy Operations



The property has a long history of industrial use dating back at least to the 1930s. From 1954 to 1986, Ciba-Geigy manufactured organic-based agricultural chemicals, leather and textile chemicals, plastics additives and pharmaceuticals in a chemical processing facility that once stood on the River Lot portion of the property.



## Site History





## FACILITY HISTORY:

1986 to 1988 : Stop Production, Demolish Plant

1989 : Ciba-EPA Consent Order to Remediate the Property



In 1986 Ciba-Geigy ceased all manufacturing processes on the property and began decommissioning and razing the chemical processing facility. There have been no manufacturing operations on any portion of the property since that time.

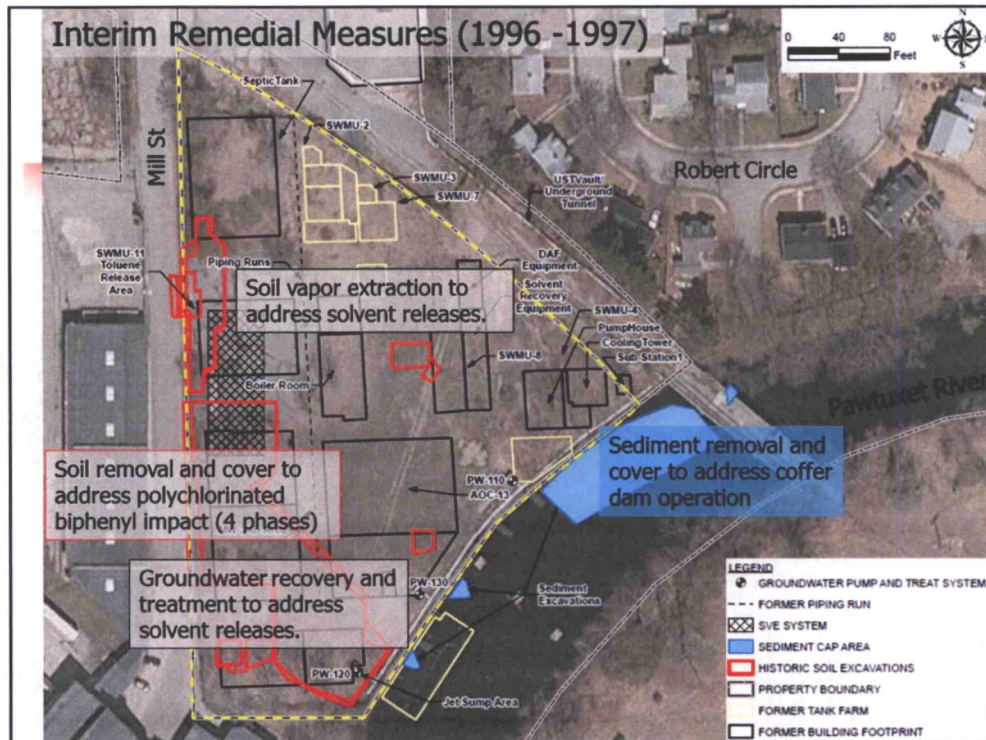
In 1988 Ciba-Geigy entered into an agreement with the Environmental Protection Agency (EPA) to investigate and remediate the property following the rules of the Resource Conservation and Recovery Act (RCRA).

## REGULATORY HISTORY (Ciba/EPA):

1990 to 1997 : Remedial Investigation and  
Interim Remedial Measures



From 1990 to 1997, with EPA oversight, Ciba-Geigy conducted several remedial investigations, and by 1996 it had implemented several required remedies on the former production facility River Lot, called interim remedial measures (IRMs), including removing and capping facility-affected surface soils and sediment and removing and controlling groundwater impacted with industrial solvents. No issues were identified on the Building Lot to warrant remedial action.



The remedies are called 'interim' because, while they provide protection of human health and the environment, they rely on what are called engineering controls to contain and remediate impacts that still remained on the property, and they recognized the fact that verification monitoring must be conducted, not only to ensure protectiveness of the remedies, but to verify that the full scope of the problem is well understood, and if not, what additional measures must be implemented.



## Excavation encumbrances



## REGULATORY HISTORY (Ciba/EPA):

1996 to 2009 : Monitor and Maintain Property



Operation of a P&T system with monitoring to inform protectiveness and restoration.

## REGULATORY HISTORY (BASF/EPA):

2010 to 2015 : BASF Review and Field Work



**GOAL:** determine the need for additional remedial actions to complete the RCRA project requirements.

**METHOD:** conduct document review, field investigation and develop a remediation plan.



Because BASF only acquired the property in 2009 and did not control past remedial efforts, it began its ownership tenure by verifying and further assessing current environmental site conditions. The goal was to fully evaluate the IRMs and determine the need for additional remedial actions to complete the RCRA project requirements and put the property back to productive use in the community. To this end, from 2011 to 2015, BASF conducted document review and field investigation tasks to validate IRM need and effectiveness, and develop a remediation plan. Investigation tasks included several rounds of soil, groundwater and sediment data collection and analysis. The results were documented in the Supplemental Remedial Investigation (SRI) Report (2014).

## Soil Investigations

Basis for PCB characterization

- 1995 RFI data to 1' BGS
- IRM, 4 excavation phases
- IRM post-x samples
- BASF SIR gridded samples, 3 phases, to 6' BGS.

### LEGEND

- SOIL BORING LOCATION
- NOT SAMPLED
- HISTORIC POST-EXCAVATION BACKFILL
- PCBs <1 mg/kg
- PCBs >1 mg/kg, but <10 mg/kg
- PCBs >10 mg/kg, but <25 mg/kg
- PCBs >25 mg/kg, but <50 mg/kg
- PCBs >50 mg/kg



**Polychlorinated biphenyls (PCBs)** are a group of manmade chemicals. They are oily liquids or solids, clear to yellow in color, with no smell or taste. PCBs are very stable mixtures that are resistant to extreme temperature and pressure. PCBs were used widely in electrical equipment like capacitors and transformers.





## PCB Characterization

	Interim Remedial Measure (1995) <sup>1</sup>	Supplemental Remedial Investigation (2011-2012) <sup>2,3</sup>	Supplemental Remedial Investigation (2013) <sup>2,3</sup>	Overall Totals	% of Total
# of Samples: <25 ppm Total PCBs	86	60	435	581	84%
# of Samples: > 25 ppm <50 ppm Total PCBs	29	1	31	61	9%
# of Samples: >50 ppm <100 ppm Total PCBs	20	1	13	34	4.9%
# of Samples: >100ppm <1,000 Total PCBs	10	0	2	12	1.7%
# of Samples: >1,000 ppm Total PCBs	1	0	0	1	0.1%
Total # of Samples Collected	146	62	481	689	

**Footnotes:**

<sup>1</sup> IRM samples are post excavation. Samples were collected after 0-1 feet and 0-2 feet deep excavations completed (Four phases of excavation).  
Samples collected from bottom and excavation sidewalls.

<sup>2</sup> SRI samples collected to characterize soils at site.

<sup>3</sup> Sample depths ranged from 0 to 6 feet below grade.

The results demonstrate a thorough evaluation of the site and it is unlikely that there are any undetected hot spots.

Dominant Aroclor detected is 1254. PCB not detected in soil at OWLA, WWTPA, Warwick support facility.





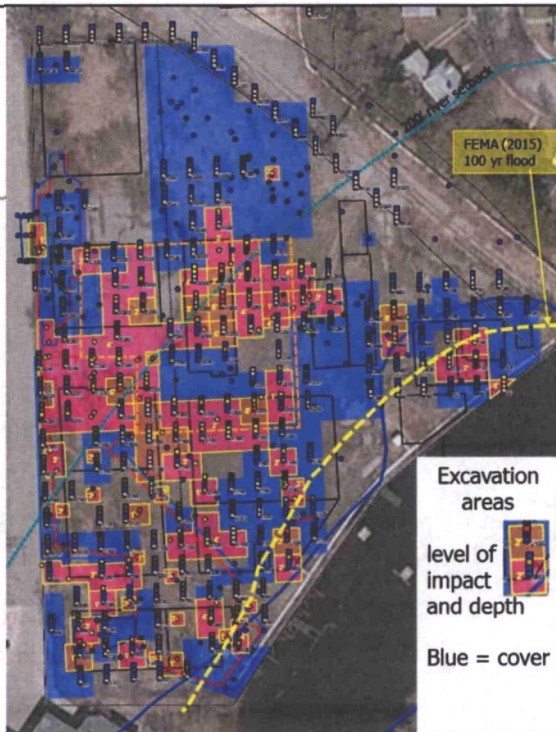
## APPROVED CMS SOIL CLEANUP PLAN

- <10 ppm PCBs with TSCA cap for high occupancy and ELUR requiring open space reuse.
- Requires >6,000 tons of soil removal/import & associated 600+ truck trips in a residential/school zone (biggest neighborhood concern)
- Unlikely able to achieve uniform <10 ppm due to foundations within 1 ft of surface
- Over-protective plan given future use (low occupancy, non-residential, open space, ELUR)
- Flood zone issues (2015 FEMA update).

# CMS Soil Plan



- >50 ppm PCB EXCAVATION
- >10 ppm PCB EXCAVATION
- >1 ppm PCB IN TOP 2 FT AND RE-USE AS BACKFILL BELOW 2 FT
- 2' EXCAVATION DEPTH





## Proposed Alternate TSCA/RIDEM Cleanup Plan

- Remove PCBs found > 50 ppm regardless of depth, and PCBs > 25 ppm < 50 ppm to 2 ft below existing grade (Resulting excavation: ~ 1,700 tons; Actual quantity per post-ex sampling).
- Relocate remaining PCBs > 10 ppm at depths less than 2 ft below grade within Floodway to proposed Cap Area
- Relocate remaining PCBs < 25 ppm @ 0-1 ft depths in Zone AE to Capped Area or Deeper AE Excavation Areas
- Install Up to 2 ft of Clean Fill Cap (may be thinner in some areas due to concrete slabs) to Meet RIDEM Requirements
- Install Fencing
- Place a RIDEM ELUR on Property (to be maintained by BASF)



## RIDEM Cap Requirements

(for PCBs >10 ppm to remain in place)

- 4-inches of Asphalt/Concrete, or
- 6-inches of Gravel, or
- 12-inches of Clean Fill Over a Geotextile Layer, or
- 24-inches of Clean Fill





## Project Schedule and Milestones

- Complete Revised PCB Corrective Action Plan  
90 % Design by May 2017
- EPA approval of Revised Plan by June 2017
  - In parallel: contractor procurement
- Public availability session upon approval
- Commence Corrective Action Plan  
Implementation August 2017 (duration 3+ months)



# Questions?

